Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Cancel claims 1-26

27. (New) An evanescent wave cavity-based optical sensor, the sensor comprising:

an optical cavity formed by a pair of highly reflective surfaces such that light within said cavity makes a plurality of passes between said surfaces, an optical path between said surfaces including a reflection from a totally internally reflecting (TIR) surface, said reflection from said TIR surface generating an evanescent wave to provide a sensing function;

a light source to inject light into said cavity; and

a detector to detect a light level within said cavity;

wherein said TIR surface is provided with an electrically conducting material over at least part of said TIR surface such that said evanescent wave excites a plasmon within said material; and

wherein a change in absorption of said evanescent wave due to a change in said plasmon excitation is detectable using said detector to provide said sensing function.

28. (New) A sensor as claimed in claim 27 wherein said optical cavity comprises a fibre optic sensor including a fibre optic, said fibre optic having a core down which light propagates by total internal reflection (TIR), and wherein said fibre optic has a region including a sensing surface at least partially coated with said electrically conducting material, wherein said sensing surface comprises said TIR surface, and wherein at said sensing surface said core is sufficiently exposed to provide an evanescent field from light guided within the fibre to said conducting material to excite said plasmon in said conducting material for said sensing.

29. (New) A sensor as claimed in claim 27 wherein said light source is configured to provide light at two wavelengths straddling said plasmon excitation.

30. (New) A sensor as claimed in claim 27 wherein said conducting material comprises one or more of islands or aggregates of conducting material; and wherein said plasmon comprises a localised plasmon.

31. (New) A sensor as claimed in claim 27 wherein said electrical conducting material comprises generally planar metallic regions having an average size of less than 50 μm.

32. (New) A sensor as claimed in claim 31 wherein said regions comprise irregular islands.

33. (New) A sensor as claimed in claim 27 wherein said electrical conducting material has a non-particulate structure.

34. (New) A sensor as claimed in claim 27 wherein said conducting material comprises a substantially continuous film and wherein said plasmon comprises a surface plasmon.

35. (New) A sensor as claimed in claim 27 wherein said sensor is a cavity ring-down sensor, wherein said cavity is a ring-down optical cavity for sensing a substance modifying a ring-down characteristic of the cavity; wherein said light source comprises a continuous wave light source for exciting said cavity; and wherein said detector is configured to monitor said ring-down characteristic, said sensed substance modifying said cavity ring-down characteristic.

36. (New) A sensor as claimed in claim 27 wherein said conducting material is bound to said TIR surface/interface by a molecular link.

37. (New) A sensor as claimed in claim 27 wherein said conducting material comprises gold.

38. (New) A sensor as claimed in claim 27 further comprising a functionalising material associated with said conducting material to provide a selective response for said evanescent wave plasmon sensing.

39. (New) A sensor for a cavity of an evanescent-wave cavity ring down device, the sensor comprising a fibre optic cable having a core configured to guide light down the fibre surrounded by an outer cladding of lower refractive index than the core, wherein a sensing portion of the fibre optic cable is configured have a reduced thickness cladding provided with an electrically conducting material such that an evanescent wave from said guided light is able to excite a plasmon within said material.

40. (New) An optical cavity-based sensing device comprising:

an optical cavity absorption sensor comprising an optical cavity formed by a pair of reflecting surfaces;

a light source for providing light to couple into said cavity; and

a light detector for detecting a level of light escaping from said cavity;

wherein said optical cavity includes a plasmon-based sensing device, said device comprising a layer of conducting material with a functionalised surface; and wherein said functionalising surface comprises a biological entity selected from the group consisting of a protein, a monoclonal antibody, a polyclonal antibody, RNA, and DNA.

41. (New) A sensor as claimed in claim 40 wherein said sensor is a cavity ring-down sensor, wherein said cavity is a ring-down optical cavity for sensing a substance modifying a ring-down characteristic of the cavity; and wherein said detector is configured to monitor said ring-down characteristic.

42. (New) A plasmon-based sensing device comprising a sensing surface bearing a layer of conducting material, and including a sensing surface refresh system.

43. (New) A plasmon-based sensing device as claimed in claim 42 wherein said layer of conducting material has a functionalised surface.

44. (New) A plasmon-based sensing device as claimed in claim 42 wherein said sensing surface refresh system comprises a system for applying an electrical charge or potential to the conducting material to refresh the device.

45. (New) A method of refreshing a plasmon-based sensing device, the device comprising a layer of conducting material with a functionalised surface, the method comprising applying an electrical charge or potential to the conducting material to refresh the device.

46. (New) A method as claimed in claim 45 further comprising switching said electrical charge or potential between a first, sensing state and a second, refreshing state.

47. (New) A method as claimed in claim 46 wherein said switching comprises reversing said electrical charge or potential.